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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,358	05/13/2002	Horst Berneth	Mo-7059/LeA 33,071	1359
157 7590 09/27/2007 BAYER MATERIAL SCIENCE LLC 100 BAYER ROAD PITTSBURGH, PA 15205			EXAMINER ANGEBRANDT, MARTIN J	
			ART UNIT 1756	PAPER NUMBER
			MAIL DATE 09/27/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/089,358	<b>Applicant(s)</b> BERNETH ET AL.	
	<b>Examiner</b> Martin J. Angebrannndt	<b>Art Unit</b> 1756	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5,7-9,12-24 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-24,27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-9,12-18 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-5,7-9,12-24 and 27-29 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The response of the applicant has been read and given careful consideration. Rejections of the previous office action, not repeated below are withdrawn. Responses to the arguments appear after the first rejection to which they are directed. The applicant has a basis for 100 mJ/cm<sup>2</sup> based upon the description of that point in the instant specification at page 58 as 0.1 J/cm<sup>2</sup> and the examiner holds that naming that point is sufficient for the use of that language in the claims..

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

I. Claims 1-18 and 29, drawn to optical recording media and use thereof.

II. Claims 19-23 and 27-28, drawn to various azo based monomers and polymerization thereof.

III. Claim 24, drawn to azo based polymer compositions.

3. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims fail to make a contribution beyond that of the prior art as evidenced by the references marked "X" or "Y" in the PCT search report of December 14, 2000. In particular any feature which unites them fails to confer patentability.

4. During a telephone conversation with Aaron Pries on March 7, 2006 a provisional election was made with traverse to prosecute the invention of group I, claims 1-18 and 29.

Affirmation of this election must be made by applicant in replying to this Office action. Claims

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19-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

**The applicant is requested to acknowledge the election in the next communication.**

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-5,7-9,12-18 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The meaning of R<sup>11</sup> to R<sup>22</sup> is not recited in the claims. Further, in formulae III-VII, it should be made clear that the two bonds are to the adjacent moieties in the side chain.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1,2,4,7-9,12-13,15,17 and 29 are rejected under 35 U.S.C. 102(b) as anticipated by Berneth et al. WO 97/44365. (Berneth et al. '799 is the English equivalent)

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Berneth et al. WO 97/44365 teaches the use of laser powers of  $10^3$  to  $10^7$  mJ/m<sup>2</sup> (0.1-1,000 mJ/cm<sup>2</sup>) with times of  $10^{-15}$  to  $10^{-3}$  second for writing patterns using polarized light. (page 5/lines 4-15). The spot sizes may be 10 nm to 20 microns (page 5/lines 17-19). Examples of useful dye include those disclosed on pages 6-20, which are pendent to the polymer backbone. Exemplified dyes are shown in the examples. The thickness of the layers may be 0.1-500 microns ([page 23/lines 24+). The use of these in holographic, analog or digital recording processes is disclosed. (24/26-25/20). In example 1, the polymer illustrated on page 27 is applied to a 2x2 cm glass plate by spin coating and pre-exposed using a light box for two hours (section 1.1, page 27). This was then inscribed using an argon ion laser operating at 280 mW with a laser spot size of 7-8 microns, an inscribing energy "E" of  $10^6$  mJ/m<sup>2</sup> (100 mJ/cm<sup>2</sup>) at a scan rate of 23.8 m/sec (section 1.3, pages 28-29). The dyes are those embraced by the language on pages 7-21 describing pendant chromophores and anisotropic moieties.

The applicant's characterization of the invention and the prior art is incorrect, first, the instant invention describes a pre-exposure on page 57 with the polarization oriented at 45 degrees to the radius followed by a writing process using a Nd:YAG laser where the polarization direction is orthogonal (at a 90° angle) to that of the preexposure (pages 57-58). The pre-exposure initializes the medium and provides conditions for maximum contrast. The prior art similarly uses a pre-exposure using a commercially available light box with a foil polarizer (section 1.1) and the writing laser is an Argion ion where the polarization is orthogonal (at a right angle to) the polarization of the pre-exposure. As the disclosed process bounded by the claims due to the fact that the claims do not exclude a pre-exposure, the processes are the same, not reversed as argued by the applicant. **As the composition and the laser power used are within**

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**the claims limitations and the teachings of the instant specification, the examiner holds that the change in the orientation inherently results in a deformation of the recording surface.**

**The applicant argues that the surface changes observed in the Kim and Hvilsted references are due to holographic recording. While it is true that the holograms are formed, the applicant's representative dodges the more important issue, that the holograms are recorded in isomerizable compositions and that the surface change in the holographic recording is due to the reorientation of the isomerizable groups during the recording of the hologram. The rejection stands.**

10. Claims 1,2,4,7-9,12-13,15,17 and 29 are rejected under 35 U.S.C. 103(a) as obvious over Berneth et al. WO 97/44365. (Berneth et al. '799 is the English equivalent)

To address those embodiments not anticipated above, the examiner holds that it would have been obvious to one skilled in the art to modify the cited example by using other co-polymers disclosed and/or using other power densities within the 10-100 mJ/cm<sup>2</sup> range with a reasonable expectation of success based upon the direction within the reference and the disclosure of equivalence.

11. Claims 1-4,7-9,12,13,15-18 and 29 are rejected under 35 U.S.C. 103(a) as obvious over Berneth et al. WO/ 9744365, in view of Elmasry '819 and Savant et al. '221.

Elmasry '819 in example 9 has a glass substrate coated with aluminum and a polymeric azo dye having the structure shown is coated to a thickness of 0.15 microns. This is exposed to a laser modulated by an acousto-optic modulator.

Savant et al. '221 in examples XIII-XX has a glass substrate and a polymeric azo dye coated to a thickness between 20- and 35 microns. This is exposed to a laser modulated by an

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electro-optic modulator which varies the polarization and is readout using polarized light and detecting the polarization of the reflected light.

It would have been obvious to one skilled in the art to one skilled in the art to modify the cited example of Berneth et al. WO/ 9744365 by adding a reflective layer as taught by Elmasry '819 and Savant et al. '221 and further to use modulation means, such as the acousto-optic modulator taught by Elmasry '819, in place of the EOM with a reasonable expectation of being able to record data and read it out using the polarization as discussed by Berneth et al. WO/ 9744365 and Savant et al. '221.

The examiner relies upon the response above to address the arguments.

12. Claims 1-5,7-9,12-18 and 29 are rejected under 35 U.S.C. 103(a) as obvious over Berneth et al. WO/ 9744365, in view of Elmasry '819 and Savant et al. '221, further in view of Ninomiya et al. '092 or Akashi et al. EP 669548.

Ninomiya et al. '092 teach LC recording layers provided on polymeric substrates (12/35-41). The overcoating of the LC polymers layer with a surface protective layer is disclosed to provide resistance to damage from abrasion, heat and the like (12/60-65). Useful materials for the surface protective layer include UV curable resins and the like including various acrylates (13/1-58).

Akashi et al. EP 669548 teaches in example 1, an LC materials applied to an Al coated polyethylene substrate and overcoated with a UV curable layer. (pages 11-12.) The use of azo dyes is disclosed with respect to the formulae a-k and the fact that X and Y may be N=N as discussed in page 5. The use of azobenzene is also specifically described. On page 4 at line 26. Useful protective layers are described. (9/6-9).

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It would have been obvious to one skilled in the art to modify the media rendered obvious by the combination of Berneth et al. WO/ 9744365 with Elmasry '819 and Savant et al. '221 by adding a protective layer known to be useful with LC materials, such as those disclosed by Akashi et al. EP 669548 or Ninomiya et al. '092 with a reasonable expectation of forming a useful azo based LC recording medium which is protected from mechanical damage. Further it would have been obvious to use other substrate materials, such as the polymers disclosed by Ninomiya et al. '092 or Akashi et al. EP 669548, in place of the glass substrate exemplified by Berneth et al. WO/ 9744365 with Elmasry '819 and Savant et al. '221 with a reasonable expectation of success based upon the disclosure of equivalent functionality.

The examiner relies upon the response above to address the arguments.

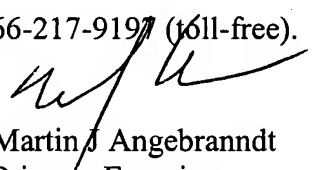
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached Monday-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J. Angebranndt  
Primary Examiner  
Art Unit 1756

09/20/2007